* $x^7 \cdot y^9 = (x+y)^{16}$ $\quad \frac{dy}{dx} = \frac{y}{x}$

Taking log

$7 \cdot \log x + 9 \cdot \log y = 16 \cdot \log(x+y)$

$$\frac{7}{x} + \frac{9}{y} \cdot \frac{dy}{dx} = \frac{16}{x+y} \cdot \left[1 + \frac{dy}{dx}\right]$$

$$\frac{7}{x} + \frac{9}{y} \cdot \frac{dy}{dx} = \frac{16}{x+y} + \frac{16}{x+y} \cdot \frac{dy}{dx}$$

$$\frac{9}{y} \cdot \frac{dy}{dx} - \frac{16}{x+y} \cdot \frac{dy}{dx} = \frac{16}{x+y} - \frac{7}{x}$$

$$\frac{dy}{dx}\left(\frac{9}{y} - \frac{16}{x+y}\right) = \frac{16x - 7x - 7y}{x \cdot (x+y)}$$

$$\frac{dy}{dx}\left(\frac{9x+9y-16y}{y \cdot (x+y)}\right) = \frac{9x-7y}{x \cdot (x+y)}$$

$$\frac{dy}{dx}\left(\frac{9x-7y}{y \cdot (x+y)}\right) = \frac{9x-7y}{x \cdot (x+y)}$$

$$\frac{dy}{dx} = \frac{(9x-7y)}{x \cdot (x+y)} \times \frac{y \cdot (x+y)}{(9x-7y)}$$

$$= \frac{y}{x} \text{ //}$$